



Superfund Record of Decision:

EPA Region 5 Records Ctr.



256719

**Enviro-Chem
(Northside Sanitary Landfill)
(Amendment), IN**

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16. Abstract (Limit: 200 words) <p>The Enviro-Chem site is a former waste recovery/reclamation/brokerage facility in Boone County, Indiana. Adjacent to the site is another Superfund site, the Northside Sanitary Landfill (NSL) which, prior to this Record of Decision (ROD) amendment, was to be remediated in a combined remedy for both sites. Land use in the area is agricultural to the south and east, and residential to the north and west, with approximately 50 residences located within one mile of the sites. Runoff from the sites is collected in a ditch which flows offsite and eventually empties into a reservoir that provides approximately 6 percent of the drinking water for the City of Indianapolis. Enviro-Chem began operations in 1977 as a recovery/reclamation/brokerage facility, accepting solvents, oils and other wastes from industrial clients. Accumulation of contaminated stormwater onsite, poor management of the drum inventory, and several spills led to State and EPA investigations of the site. Between 1977 and 1981, the State permitted Enviro-Chem to dispose of part of its waste at the adjacent NSL. In 1981, a consent decree was issued against Enviro-Chem giving them until November 1982 to comply with environmental laws and regulations. In May 1982, the State ordered Enviro-Chem to close and environmentally secure the</p> <p>(See Attached Page)</p>				
17. Document Analysis a. Descriptors Record of Decision - Enviro-Chem (Northside Sanitary Landfill), IN First Remedial Action (Amendment) - Final Contaminated Medium: soil Key Contaminants: VOCs (PCE, TCE, toluene), other organics (phenols) b. Identifiers/Open-Ended Terms c. COBATI Field/Group				
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Abstract (Continued)

site because it failed to reduce hazardous waste inventories. Subsequently, two emergency removal actions were conducted to remove the major sources of contamination. From 1983 to 1984, approximately 30,000 drums, 220,000 gallons of waste, and 5,650 cubic yards of soil and sludge were removed offsite and treated. In 1985, 20,000 gallons of contaminated water were removed. A 1987 ROD provided a combined remedy for both NSL and Enviro-Chem due to their proximity and other similarities. The 1987 ROD addressed source control through soil excavating, dewatering, and onsite disposal, followed by capping; pumping and onsite treatment of ground water; and implementing deed and access restrictions. However, since the signing of the ROD, EPA and the State have been engaged in negotiating with the PRPs for each site. These negotiations have resulted in separate, complementary remedies and individual consent decrees for each site, and modifications to the original selected remedy. This ROD amends the 1987 ROD and provides a comprehensive site remedy for the Enviro-Chem site addressing source control instead of ground water remediation. The primary contaminants of concern affecting the soil are VOCs including PCE, TCE, toluene; and other organics including phenols.

The amended remedial action for this site includes treating contaminated soil onsite using soil vapor extraction with a granulated activated carbon system to control the extracted vapor, if necessary; and implementing a contingent remedy for a subsurface ground water collection and treatment system, based on monitoring results, if clean-up objectives are not reached in 5 years. Other remedial actions documented in the 1991 ROD amendment include capping the site, implementing site access restrictions, and monitoring of the subsurface and surface water are not affected by this amendment. The estimated present worth for this remedial action ranges between \$5,000,000 and \$9,000,000. No O&M costs were provided for this remedial action.

PERFORMANCE STANDARDS OR GOALS: Soil clean-up goals are based on ingestion of subsurface water at the site boundary, and are calculated from the Acceptable Subsurface Water Concentrations assuming a dilution of leachate to subsurface water of 1:196, and using established partition coefficients. Chemical-specific soil clean-up goals include phenol 9,800 ug/kg, TCE 240 ug/kg, PCE 130 ug/kg, toluene 238,000 ug/kg, and total xylenes 195,000 ug/kg.

Declaration for the Record of Decision Amendment

Site Name and Location

Environmental Conservation and Chemical Corporation, Zionsville, Indiana

Statement of Basis and Purpose

This decision document, together with a Record of Decision dated September 25, 1987, represents the selected remedial action for the Environmental Conservation and Chemical Corporation site developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

This decision is based on the contents of the administrative record for the Environmental Conservation and Chemical Corporation site. The attached index identifies the items which comprise the administrative record upon which the decision to amend the 1987 Record of Decision, and the selection of the modified remedial action is based.

The State of Indiana concurs in the remedy selected by U.S. EPA for the Environmental Conservation and Chemical Corporation site.

Description of the Remedy

The primary reason for amending the 1987 Record of Decision is to reflect the decision to implement separate, complementary remedies for the Environmental Conservation and Chemical Corporation and Northside Sanitary Landfill sites, instead of the one combined remedy selected in the 1987 Record of Decision, and secondarily, to modify the selected remedy.

For the Environmental Conservation and Chemical Corporation site, the major components of the remedial action, as modified, include:

- Soil vapor extraction, concentration and destruction
- RCRA Subtitle C cap
- Access restrictions
- Subsurface and surface water monitoring
- Contingent subsurface water collection and treatment

Declaration

The selected remedy, as modified herein, is protective of human health and the environment, attains Federal and State requirements that are applicable or relevant and appropriate to this remedial action, and is cost-effective.

This remedy satisfies the statutory preference for remedies that employ treatment that reduce toxicity, mobility or volume as a principal element and utilize permanent solutions and alternative treatment technologies to the maximum extent practicable.

Because this remedy will result in hazardous substances remaining on-site, pursuant to Section 121(c) of CERCLA, a review will be conducted at the site within five years after commencement of the remedial action and at least every five years thereafter to ensure that the remedy continues to provide adequate protection of human health and the environment.

Date

June 7th, 1991.

Valdas V. Adamkus
Regional Administrator
Region V

Record of Decision Amendment
Environmental Conservation and Chemical Corporation

I. LOCATION AND DESCRIPTION

The Environmental Conservation and Chemical Corporation (also referred to as Enviro-Chem, or ECC) and the Northside Sanitary Landfill (NSL) facilities are both on the Superfund National Priorities List, and are located adjacent to each other. On September 25, 1987, a Record of Decision (ROD) was signed which selected a combined remedy for the two sites. Since the time the original ROD was signed, U. S. EPA and the State of Indiana have engaged in negotiations with Potentially Responsible Parties (PRPs) for each site. These negotiations have resulted in separate remedies for each site, individual Consent Decrees for each site, this amendment to the 1987 ROD, and an amendment to the 1987 ROD relating to the NSL site. The purpose of this ROD Amendment is to describe the changes from the remedy selected in the 1987 ROD, as they pertain to ECC.

The Enviro-Chem site is located in a rural area of Boone County, about five miles north of Zionsville and ten miles northwest of Indianapolis. Farmland borders the southern edge of the site and borders the eastern edge of NSL. Residential properties are located to the north and west, within one-half mile of the facility. A small residential community, Northfield, is located north of the site on U. S. 421. Approximately fifty residences are located within one mile of the site.

An unnamed ditch runs north to south between the ECC and NSL sites, along the western edge of NSL, and joins Finley Creek at the southwestern corner of the NSL landfill. Finley Creek runs along the eastern and southern edges of the NSL site and flows into Eagle Creek about one-half mile downstream from the sites. Eagle Creek flows south from its confluence with Finley Creek for ten miles before it empties into Eagle Creek Reservoir. The reservoir supplies approximately six percent of the drinking water for the City of Indianapolis.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

The 1987 ROD set forth the history of the ECC site through the date of its issuance. Subsequent to the issuance of the 1987 ROD, the following activities of pertinence have occurred:

1. Both before and after the 1987 ROD was issued, a group of defendants, who in 1983 had entered into a partial settlement of a pending court action, proposed to clean up the Enviro-Chem site

utilizing a soil vapor extraction system. In a letter dated February 1988, U. S. EPA rejected this proposal because, among other deficiencies, the proposal failed to consider the cost of pilot testing or of a granular activated carbon system to treat the extracted vapor.

2. Subsequently, this group of defendants undertook a pilot soil vapor extraction study at Enviro-Chem. The results of the study, which was performed in June 1988, indicate that a vapor extraction system, with certain enhancements, may significantly reduce the levels of volatile organics and phenols in the soils.

3. These same parties then offered to perform a remedy at the Enviro-Chem site utilizing a closed soil vapor extraction system, with a granulated activated carbon system to treat the extracted vapor. In response, U.S. EPA and the State of Indiana entered into negotiations with these parties concerning the terms under which they might assume responsibility for remediating the site. The proposed Consent Decree and Exhibit A embody those negotiated terms and provide the details of the remedy as it will be performed pursuant to the ROD as amended, herein.

III. COMMUNITY RELATIONS

This ROD amendment, as proposed, was available for public comment for a thirty day period, pursuant to Section 117 of SARA. An Administrative Record containing the documents considered or relied upon in reaching the decision in this Amendment has been available at the Zionsville Town Hall and at the offices of Region V, U.S. EPA. in Chicago.

IV. DOCUMENTATION OF SIGNIFICANT CHANGES FROM 1987 ROD

This ROD Amendment addresses those elements of the remedy which have changed from the 1987 ROD and the requirements and preferences under SARA. Many elements of the original 1987 ROD do not change. Therefore, the findings made in the 1987 ROD remain the same except for the changes described in this ROD Amendment.

The major differences between the remedy selected for ECC in the 1987 ROD and the remedy selected in this amendment are as follows:

- The use of soil vapor extraction technology is selected in this Amendment, instead of the ground water collection and onsite treatment selected in the 1987 ROD.
- The ground water collection and treatment selected in the 1987 ROD would have resulted in cleanup of the site after a long period of system operation, whereas the soil vapor extraction selected in this Amendment will result in cleanup of the site in a significantly shorter period of time.

- There were no on-site cleanup criteria specified in the 1987 ROD; this Amendment specifies Acceptable Soil Concentrations, which are based on ingestion of subsurface water at the site boundary and Acceptable Subsurface Water concentrations based on 1×10^{-6} risk, on Maximum Contaminant Levels, on Maximum Contaminant Level Proposed Goals, or on Lifetime Drinking Water Health Advisories.
- If the soil vapor extraction does not reduce the specified onsite contaminants to their cleanup standards within 5 years, a subsurface water collection system may be installed, the collected water treated in accordance with Clean Water Act and CERCLA requirements, and disposed of. This contingent activity is similar to a major component of the 1987 ROD remedy, which required collection and onsite treatment of ground water. However, under this ROD Amendment, the interception of the ground water will occur at a point nearer the ECC contamination.

Key portions of the remedy which remain the same from 1987 are summarized here:

- Access restrictions will be implemented to control use of the site.
- A RCRA Subtitle C cap will be installed to prevent direct contact with contaminated soils, and to reduce infiltration. The cap will also enhance the vapor recovery component of the amended remedy.
- The off-site cleanup levels (Acceptable Stream Concentrations) remain the same as in the 1987 ROD, except that a cleanup criterion for PCBs has been added, which represents a 1×10^{-6} risk level.
- Monitoring of the subsurface water and surface water will be implemented to ensure that no contamination exceeds surface water standards (see Attachment 1).

This ROD Amendment selects separate and distinct remedies for ECC and NSL, which do not encompass the additional area of contamination south of ECC that was discussed in the 1987 ROD. Pre-design investigations indicated that this is a discrete contaminated area, and the cleanup of it will be pursued in another manner.

During the design phases for both the ECC and the NSL remedies, efforts will be made to ensure that the two remedies will be compatible with each other.

SUMMARY**ENVIRONMENTAL CONSERVATION AND CHEMICAL CORPORATION
DIFFERENCES BETWEEN 1987 REMEDY AND REMEDY, AS MODIFIED****1987 REMEDY****MODIFIED REMEDY**

Combined remedy for ECC and NSL

Separate, compatible remedies for ECC and NSL

Ground water collection and treatment

Soil vapor extraction

Long-term treatment of ground water

Removal of source of contamination by reducing concentrations of organic chemicals to cleanup levels within 5 years

No on-site cleanup criteria

Acceptable Soil Concentrations and Acceptable Subsurface Water Concentrations established

No additional remedial requirements if cleanup standards not achieved

Subsurface water collection and treatment instituted if soil vapor extraction does not achieve cleanup levels in 5 years

Figure 1 shows some components of the remedial action selected in this ROD Amendment.

V. DESCRIPTION OF MODIFIED REMEDY

The technical attachment to the Consent Decree (Exhibit A) provides details regarding the remedial action selected in this ROD Amendment. The remedial action consists of the following general components:

- Soil vapor extraction, concentration and destruction
- RCRA Subtitle C cap
- Access restrictions
- Subsurface and Surface Water Monitoring
- Contingent subsurface water collection and treatment

Soil Vapor Extraction, Concentration and Destruction

The objective of the soil vapor extraction activity is to remove and destroy volatile organic compounds and selected base neutral/acid organics from the soils through a series of injection and extraction trenches. Operation of the soil vapor extraction system will be terminated when the Acceptable Soil Concentrations, as shown in Attachment 1, and discussed below, are achieved and verified as specified below.

The 1987 ROD selected Acceptable Stream Concentrations as ARARs for off-site subsurface water and for surface water. In addition, a cleanup level for PCBs has been added, which represents a 1×10^{-6} risk level. Achievement of the Acceptable Stream Concentrations for off-site subsurface water and surface water are also required in this ROD Amendment.

Because this ROD Amendment adds a source removal component, additional standards and regulations are applicable or relevant and appropriate. To confirm that the required level of cleanup of on-site soils has occurred, this ROD Amendment establishes Acceptable Subsurface Water Concentrations which must be met in on-site till wells, and Acceptable Stream Concentrations which must be met in off-site subsurface water and surface water.

Those Acceptable Subsurface Water Concentrations specified herein are either risk-based standards, Maximum Contaminant Levels, Maximum Contaminant Level Proposed Goals or Lifetime drinking water health advisories. The Acceptable Subsurface Water Concentrations specified in Attachment 1 will have to be met in on-site till wells as part of the post soil cleanup verification required to shut off the soil vapor extraction system. In addition, these cleanup levels form the basis for the Acceptable Soil Concentrations.

The Acceptable Soil Concentrations will have to be met in on-site soil samples as part of the post soil cleanup verification required to shut off the soil vapor extraction system. They are based on ingestion of subsurface water at the site boundary, and are calculated from the Acceptable Subsurface Water Concentrations, assuming a dilution of leachate to subsurface water of 1:196, and using established partition coefficients. The ratio of leachate to subsurface water is based on Appendix C of the ECC Remedial Investigation report.

Acceptable Soil Concentrations based on ingestion of soil were considered, but were eliminated. For each parameter showing an Acceptable Soil Concentration in Attachment 1, the standards based on subsurface water ingestion are significantly lower than the standards based on soil ingestion. Because the site will be covered with a Subtitle C cap and direct contact with the soil will be prevented, the pathway of most concern is through the subsurface water.

Achievement of the Acceptable Soil Concentrations shown in Attachment 1 will be verified when each of the following is met: (1) soil vapor collected from restarts of the system show calculated soil vapor concentrations in equilibrium with the Acceptable Soil Concentrations; (2) on-site till wells show compliance with the Acceptable Subsurface Water Concentrations, also shown in Attachment 1; and (3) soil samples collected onsite show compliance with the Acceptable Soil Concentrations.

When verification has been demonstrated, operation of the soil vapor extraction system will be terminated. If the Acceptable Soil Concentrations are not met within five years, U.S. EPA may require implementation of the leachate/subsurface water collection and treatment system.

RCRA Subtitle C Cap

The cap placed on the site will have multiple layers and will comply with the requirements of Subtitle C of the Resource Conservation and Recovery Act. The cap will prevent direct contact with contaminated soils, reduce infiltration, and enhance the soil vapor extraction system.

Access Restrictions

Access restrictions will consist of those specified in the 1987 ROD.

Subsurface and Surface Water Monitoring

The purpose of the subsurface and surface water monitoring is to detect the presence of the volatile organic compounds, base neutral/acid organics, PCBs, and heavy metals specified in Attachment 1 in the subsurface and surface water during and after soil vapor extraction, and to provide information to determine the effectiveness of the soil vapor extraction program.

Once the Acceptable Soil Concentrations have been verified, and the soil vapor extraction system has been shut off, sampling of off-site till wells, on-site till wells, off-site sand and gravel wells, and surface water will be conducted for seven years on a semi-annual basis.

If, during the seven years of monitoring, cleanup levels are exceeded, construction of a ground water collection trench and the treatment of the collected ground water will occur. This action is substantively identical to the component of the 1987 remedy requiring construction of a french drain, onsite treatment of the collected ground water, and discharge pursuant to an National Pollutant Discharge Elimination System permit to Finley Creek. This amended remedy contemplates a more flexible approach to this activity, however, in that the trench may be located in closer

proximity to the contaminated area, and the collected ground water may be sent to a publicly owned treatment works, consistent with applicable law and regulations.

Table 1 is a summary comparison of the 1987 ROD and the 1989 ROD Amendment relative to the Agency's nine evaluation criteria.

VI. STATUTORY DETERMINATIONS

U.S. EPA has determined, and the Indiana Department of Environmental Management concurs, that the remedy selected in this ROD Amendment satisfies the statutory requirements specified in Section 121 of SARA to protect human health and the environment; attain ARARs; utilize permanent solutions and alternative treatment technologies to the maximum extent practicable, and to provide for a cost-effective response.

Protection of Human Health and the Environment

The remedy selected in this ROD Amendment will eliminate the migration of contaminants in the subsurface water and will prevent their discharge into the Unnamed Ditch and Finley Creek. This will be accomplished by removing organic chemicals from the soil through soil vapor extraction.

Some short term air and water releases may occur during the construction of the soil vapor extraction system. Engineering controls will be employed to minimize the releases, in accordance with any applicable laws and regulations.

Attainment of Applicable, or Relevant and Appropriate Requirements

Section 121(d) of SARA requires that remedial actions meet legally applicable or relevant and appropriate requirements (ARARs) of other environmental laws. These laws may include: the Resource Conservation and Recovery Act (RCRA), the Clean Water Act (CWA), the Clean Air Act (CAA), the Toxic Substances Control Act (TSCA), the Safe Drinking Water Act (SDWA), and certain State laws which have stricter requirements than the corresponding Federal law. A "legally applicable" requirement is one which would legally apply to the response action if that action were not taken pursuant to Section 104 or Section 106 of CERCLA. A "relevant and appropriate requirement" is one that, while not legally applicable to the remedial action, addresses problems or situations sufficiently similar to those encountered at the site that their use is well suited to the remedial action.

The discussion contained in the 1987 ROD pertaining to ARARs continues to be pertinent to the amended remedy. The method for achieving compliance with those ARARs, though, has been modified.

The following is a description of the ARARs for the amended

components of the remedy and an explanation of how this amended remedial action meets those requirements:

1. RCRA Closure/Post Closure Requirements.

The amended remedy will satisfy closure and post-closure requirements of RCRA and the analogous State of Indiana requirements applicable to hazardous waste landfills.

The 1987 remedy specified a RCRA Subtitle C cap, a french drain, ground water collection and treatment, and 30 years of ground water monitoring. The amended remedy herein provides for the utilization of enhanced soil vapor extraction technology to substantially reduce the levels of contaminants remaining onsite, construction of the Subtitle C cap, and 7 years of surface and subsurface water monitoring once soil cleanup criteria have been verified. It also provides for construction of a subsurface water collection trench if the monitoring indicates contaminants are present above cleanup levels. This is, in essence, the "corrective action" which would be required if compliance monitoring disclosed the need for same under RCRA.

The Indiana Department of Environmental Management, which is authorized to administer RCRA, has determined, through its Commissioner, that utilization of soil vapor extraction to significantly reduce contamination in soil at the site warrants the contingent elimination of the french drain and reduction of the time period for post-closure ground water monitoring. The U.S. EPA hereby similarly determines that this modification complies with RCRA. The RCRA regulations applicable to closures of hazardous waste landfills are found at 40 CFR 265.110, et seq. Section 265.117 provides that post-closure monitoring must continue for 30 years, but that,

"Any time preceding closure of a hazardous waste unit,...
the Regional Administrator may:

- (i) Shorten the post-closure care period applicable to the hazardous waste management unit, if all disposal units have been closed, if he finds that the reduced period is sufficient to protect human health and the environment (e.g., leachate or ground-water monitoring results, characteristics of the hazardous waste, application of advanced technology, or alternative disposal, treatment, or reuse techniques indicate that the hazardous waste management unit or facility is secure);

It is the determination of U.S. EPA and the State of Indiana Department of Environmental Management that use of soil vapor extraction, construction of the cap, and the tripartite verification of soil cleanup, is sufficient to protect human health and the environment, so as to justify shortening the compliance

monitoring period to seven years from the date that soil cleanup has been verified. This determination is, in part, based on the fact that those contaminants which will not be significantly reduced by use of soil vapor extraction, are relatively insoluble and immobile, and therefore unlikely to migrate into the subsurface water. It is further based on the finding that soil vapor extraction will significantly reduce the volatile organic compounds and other contaminants which do migrate into and with ground water.

The soil vapor extraction remedy selected herein is both "innovative" and "advanced". Its innovative aspect is a function of the use of injection and extraction trenches, with a cap, which produces a closed system. It is advanced in that it will utilize granular, activated carbon to remove the contaminants from the vapor.

Moreover, this amended remedy selects a backup component, implementation of a subsurface water collection and treatment procedure similar to the french drain specified in the 1987 ROD, if sample results disclose contaminants at levels above the subsurface and surface water cleanup levels during the seven year compliance monitoring period. The collected subsurface water would be discharged pursuant to an NPDES permit, as described in the 1987 ROD, sent to a publicly owned treatment works, or otherwise disposed of, in a manner which complies with applicable or relevant and appropriate laws and regulations, including the Clean Water Act.

2. On-site Soil and On-site Subsurface Water

As described above, the Acceptable Soil Concentrations are the cleanup levels for on-site soils, and the Acceptable Subsurface Water Concentrations are the ARARs for on-site subsurface water. Both the Acceptable Soil Concentrations and the Acceptable Subsurface Water Concentrations determine the level of cleanup on-site. In order for the soil vapor extraction system to be shut off, and additional remedial measures not be required, these cleanup levels/ARARs will have to be met.

3. Off-site Subsurface Water and Surface Water

The Acceptable Stream Concentrations specified in Table 1 of the 1987 ROD remain the ARARs for off-site subsurface water and surface water. In addition, a cleanup level for PCBs has been added, which represents a 1×10^{-6} risk level. The remedy selected in this ROD Amendment will meet or exceed these ARARs.

4. Subsurface Water Protection

The subsurface water from underneath Enviro-Chem generally flows to the southeast and discharges into the Unnamed Ditch. The removal

of organic chemicals from the soil, and the subsequent prevention of contaminant migration are consistent with U.S. EPA's Ground Water Protection Strategy. In addition, the State's drinking water and industrial water standards would not be jeopardized thus adhering to Indiana's nondegradation policy.

5. On-Site Construction Activities

The on-site construction activities at Enviro-Chem may create fugitive dust. Any precautions required by state or other applicable laws will be taken during construction to minimize fugitive dust emissions.

Cost-Effectiveness

The modified remedy selected in this ROD Amendment is as protective as, and offers greater long-term effectiveness than the 1987 ROD remedy. In the Feasibility Study completed at the time of the 1987 ROD, the cost of the combined Northside/Enviro-Chem remedy was estimated to be \$33.9 million. The modified remedy discussed in this ROD Amendment for ECC alone is estimated to cost at minimum \$5 million and at most, \$9 million. The total cost of the separate remedies for Northside and Enviro-Chem is now estimated to be between \$30 and \$39 million. The modified remedy selected in this ROD Amendment contains additional remedy components, as discussed in Section V; the modified remedy is a cost-effective solution.

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable, and Preference for Treatment as a Principal Element

If the soil vapor extraction program selected in this ROD Amendment is successful, the concentrations of organic chemicals in on-site soils and subsurface water will be permanently reduced to levels which are below those shown in Attachment 1. If the soil vapor extraction program is not successful within the required timeframe, subsurface water will be collected and treated, preventing the migration of contaminants off-site.

VII. FUTURE ACTIONS

The anticipated Remedial Design and Remedial Action schedule is attached as Figure 2.

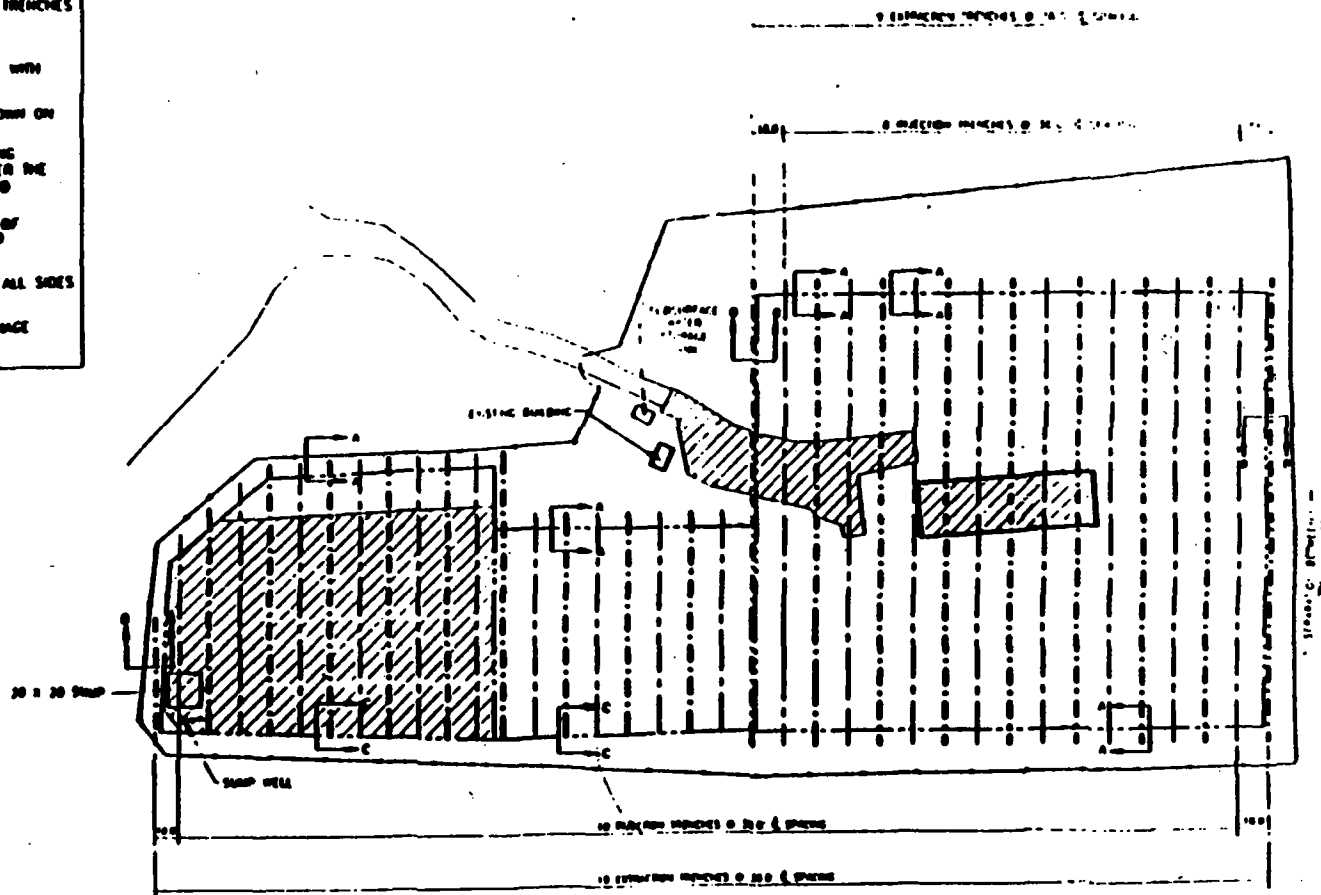
SEQUENCE OF CONSTRUCTION ACTIVITIES

1. GRADE EXISTING TREATMENT SITE (AREA NOS. 1, 2, & 3) TO EVEN SLOPE
2. EXCAVATE INJECTION AND EXTRACTION TRENCHES
3. FILL INJECTION TRENCHES WITH FLOAT STONE AS SHOWN ON FIGURE 2-5
4. FILL EXTRACTION TRENCHES TO GRADE WITH FLOAT STONE AS SHOWN ON FIGURE 2-5
5. EXCAVATE DEADMAN TRENCHES AS SHOWN ON FIGURE 2-6.
6. SOIL REMOVED FROM TRENCHES DURING CONSTRUCTION SHALL BE GRADED OVER THE SURFACE IN AREAS 1 AND 2 PRIOR TO INSTALLATION OF THE COVER SYSTEM.
7. COVER TREATMENT SITE WITH 1 FOOT OF NATIVE SOIL IN 6 LAYERS COMPACTED TO 95% PROCTOR DENSITY
8. COVER TREATMENT SITE WITH 60 mil HDPE PLASTIC MEMBRANE ANCHORING ALL SIDES IN DEADMAN TRENCH AS SHOWN ON FIGURE 2-5
9. COVER TREATMENT SITE WITH 6" DRAINAGE LAYER OF SAND AS SHOWN ON FIGURE 2-5

GRAPHIC SCALE (FT)
0 25 50 100



LEGEND	
	PERCE LINE
	BUILDING LINE
	PROPERTY BOUNDARY
	DRAINAGE LINES
	INJECTION TRENCHES
	EXTRACTION TRENCHES
	CONCRETE



ENVIRONMENTAL CONSERVATION AND CHEMICAL CORPORATION ZIONSVILLE, INDIANA SQM VAPOR EXTRACTION TRENCH PLAN ERM North Central Inc.	FIGURE NO.
	2-1
	7-11-03

Figure 1

TABLE 3-1 (Page 1 of 2)
 SITE-SPECIFIC ACCEPTABLE CONCENTRATIONS
 ENVIRONMENTAL CONSERVATION AND CHEMICAL CORPORATION (ECC) SITE

Compounds	Acceptable Subsurface Water Concentration (1,2) (ug/l)	Acceptable Stream Concentration (3,4) (ug/l)	Acceptable Soil Concentration (5,6) (ug/kg)
VOLATILE ORGANICS (VOCs):			
Acetone	3,500 RB		490
Chlorobenzene	60 MCLGP		10,100
Chloroform	100 MCL	15.7	2,300
1,1-Dichloroethane	0.38 RB		5.7
1,1-Dichloroethene	7 MCL	1.85	120
Ethylbenzene	680 MCLGP	3,280	234,000
Methylene Chloride	4.7 RB	15.7	20
Methyl Ethyl Ketone	170 LBMA		75
Methyl Isobutyl Ketone	1,750 RB		8,900
Tetrachloroethene	0.69 RB	8.85	130
Toluene	2,000 MCLGP	3,400	238,000
1,1,1-Trichloroethane	280 MCL	5,280	7,200
1,1,2-Trichloroethane	8.61 RB	41.8	22
Trichloroethane	5 MCL	80.7	240
Total Xylenes	440 MCLGP		195,000
BASE NEUTRAL/ACID ORGANICS:			
Bis(2-ethylhexyl)phthalate	2.5 RB	50,000	
Di-n-Butyl Phthalate	3,500 RB	154,000	
Diethyl Phthalate	28,000 RB	52,100	
Isophorane	8.5 RB		
Naphthalene	14,000 RB	620	
Phenol	1,400 RB	570	9,800
INORGANICS:			
Antimony	14 RB		
Arsenic	50 MCL	0.0175	
Barium	1,000 MCL		
Beryllium	175 RB		
Cadmium	10 MCL		
Chromium VI	50 MCL	11	
Lead	50 MCL	10	
Manganese	7,000 RB		
Nickel	150 LBMA	100	
Silver	50 MCL		
Tin	21,000 RB		
Vanadium	245 RB		
Zinc	7,000 RB	67	
Cyanide	154 LBMA	5.2	
PESTICIDES/PCBs:			
PCBs	0.0045 RB (7)	0.000079 (7,8)	

TABLE 3-1 (Page 2 of 2)
SITE-SPECIFIC ACCEPTABLE CONCENTRATIONS
ENVIRONMENTAL CONSERVATION AND CHEMICAL CORPORATION (ECC SITE)

NOTES:

- (1) **RB** = Risk-based standard. U.S. EPA, Draft RCRA Facility Investigation Guidance, 1987.
- MCL** = Drinking water Maximum Contaminant Level. 40 CFR 141
- MCLGP** = Drinking water MCL goal, proposed. U. S. EPA Superfund Public Health Evaluation Manual, update of November 16, 1987.
- LDWHA** = Lifetime drinking water health advisory. U.S. EPA, Superfund Public Health Evaluation Manual, update of November 16, 1987.

(2) In the event that higher concentrations than those set forth for any parameter in this column are present in the upgradient subsurface water in the till and/or sand and gravel according to the procedure specified below, then those higher upgradient subsurface water concentrations and not the values set forth in this table shall constitute the Acceptable Subsurface Water Concentrations within the meaning of this Exhibit A and the Consent Decree. Those upgradient subsurface water concentrations are referred to in this Exhibit A as "Applicable Subsurface Water Background Concentrations." Twelve subsurface water samples will be taken from existing or new well locations, approved by EPA, over at least a 12 month period in areas upgradient of the site. The exact procedure, location of wells, and schedule for collecting and analyzing the samples will be approved by EPA, after consultation with the State, prior to its implementation. Subsurface samples for inorganics and PCB analysis will be filtered. For each parameter, the analytical results from the 12 samples will be analyzed using standard statistical procedures. The mean and standard deviation will be calculated, and all non-detects will be assigned a value equal to 1/2 the EPA-approved quantification limit. For purposes of this Document, "Applicable Subsurface Water Background Concentrations" is defined as two (2) standard deviations above the calculated mean of these 12 samples.

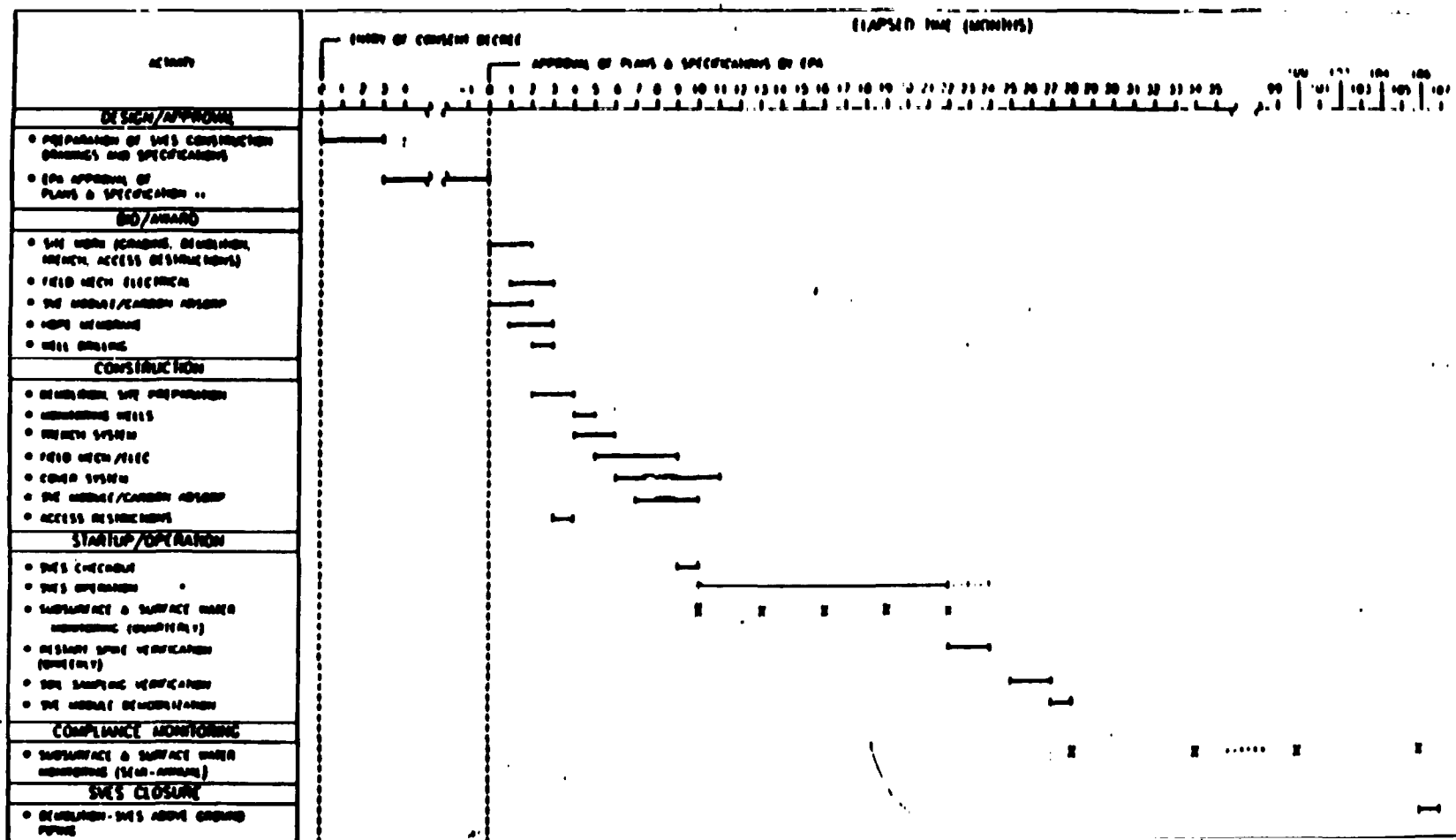
(3) Stream Criteria, from Table 1 of the Record of Decision for the site, September 25, 1987.

(4) In the event that higher concentrations than those set forth for any parameter in this column are present in the upstream surface water, then those higher upstream concentrations and not the values set forth in this table shall constitute the Acceptable Stream Concentrations within the meaning of this Exhibit A and the Consent Decree. Those higher upstream surface water concentrations are referred to in this Exhibit A as

[illegible]

TABLE 1
ENVIRO-CHEM
COMPARISON OF EVALUATION CRITERIA

	<u>1987 REMEDY</u>	<u>MODIFIED REMEDY</u>
Protection of human health and the environment	Surface water protected by ground water collection	Surface water protected by soil vapor extraction
Compliance with ARARs	Compliance with off-site ARARs (Acceptable Stream Criteria)	Compliance with off-site ARARs, (Acceptable Stream Criteria), on-site ARARs (Acceptable Soil Concentrations and Acceptable Sub-surface Water Concentrations)
Long-term Effectiveness	Less certain, due to slower removal of contaminants, and the need for long-term maintenance of the treatment system	Faster removal of contaminants, and less time required for long-term maintenance
Reduction in Toxicity, Mobility and Volume	Slow reduction in volume of contaminants from ground water collection	Faster reduction in volume of contaminants from soil vapor extraction
Short-term Effectiveness	Little site disturbance; little chance of releases during construction	Possibility of air and water releases during construction; these will be minimized through engineering controls
Implementability	Simple construction; long-term operation and maintenance required	More complex construction; operation and maintenance time reduced
Cost	\$3 million	\$5 to \$9 Million
State Acceptance	Full acceptance	Full acceptance
Community Acceptance	Full acceptance	Anticipate acceptance



NOTE TO FIGURE 3-1

- SWS SWS WORK (CONSTRUCTION SYSTEM)
- SCHEDULE ASSUMES 12 HOURS OPERATION OF SWS ACTUAL PERIOD OF OPERATION COULD BE SHORTER OR LONGER DEPENDING ON PERFORMANCE OF SWS THE SCHEDULE FOR EACH ACTIVITY LISTED BELOW "SWS OPERATION" WILL BE ADJUSTED ACCORDINGLY AS DESCRIBED IN SECTION 4.0 OF (EPA) A

** "PLANS AND SPECIFICATIONS" MEANS "PROJECT PLANS, CONSTRUCTION CONTRACT SPECIFICATIONS, AND REVISED DRAWINGS NECESSARY TO START COMPETITIVE BIDDING"

REMEDIAL ACTION IMPLEMENTATION SCHEDULE	FIGURE NO
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ERM ERM - North Central, Inc	